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AUTHOR Sirois, Herman A.; Davis, Robert L.
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ABSTRACT

Noting that traditional measures of textbook difficulty and traditional measures of student reading ability suffer from a lack of correspondence, this booklet deals with the problems of (1) identifying the levels of conceptual difficulty of text materials, (2) identifying students' abilities to understand text materials, (3) matching the conceptual levels of texts with the conceptual abilities of students, and (4) identifying, developing, and implementing adaptive teaching strategies that compensate for situations where texts and student conceptual levels do not match. The first section of the booklet reviews traditional methods of textbook and student readability measurement, and then describes the Degrees of Reading Power program, a unified method of student and text readability assessment. The second section considers whether certain instructional strategies are appropriate to situations of text/student mismatches and presents several strategies that are effective in those situations. The third section discusses the design of instruction for the purposes of developing student "read-ability" competence and of developing instructional strategies for use in cases of text/student mismatch. Section 4 describes the implementation of such an instructional design and strategies, and the final section discusses the evaluation of student progress in the understanding of connected prose. (FL)

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Readability vs. Read-Ability

Instructional Design for Reading and the Content Area

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Herman A. Sirois and Robert L. Davis

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I. The Conceptual Understanding of Connected Prose

Note the title of this monograph: Readability vs. Read-Ability. Note the "vs." rather than an "and". Unfortunately, at this point in time, the title cannot be Readability and Read-Ability although that is precisely the goal of the Readability Instructional Design reviewed herein. Readability (the difficulty of printed material) and read-ability (students' ability to understand printed material) all too often do not match or even come close. It appears that we have created a generation of students who can decipher any combination of letters, however strange. This pervasive skill has lulled us into believing that these students have some comprehension of that which they so readily decode. This does not, however, appear to be the case in fact.

Reading is more than "decoding". Reading is also more than the mere comprehension of the printed word. Competency in reading obtains at a point beyond the deciphering of the words and the translation of their "meaning". Competency in reading occurs at

that point where the reader's mind meets that of the author: i.e., where the reader achieves a conceptual understanding of the material at hand. This may indeed be at a second or third grade level (The clouds hung in the sky like giant white balloons.) Or it may be at a more advanced level. What is important is that we (those of us who present the printed word to children) know the difference in these levels, both as they exist and change over time in children and as they are demanded by the various printed materials to which we expose children.

A. Readability vs. Read-Ability

Educators have long lamented the lack of consistency, let alone the lack of validity, in measures of "readability" of texts and other printed materials. A grade-level-equivalent of 5.0 as offered by a publisher will typically hold little relationship to a fifth grade student. In fact, grade-level-equivalents from a variety of sources, such as a student's reading grade-level-equivalent from a standardized test, the chronological grade placement of the student, and the publisher's grade level assignment of a text, bear so little relationship to each other that they tend to confuse and interfere with instruction rather than assist as they should.

Readability, William Saffire's (1982) objection to this "non-word" aside, refers to the conceptual level of connected prose. More specifically, readability refers to the measure of this conceptual level, taking into account, not only vocabulary,

but also length, structure, and complexity of sentences and paragraphs. Given such a measure of readability, it would follow that a passage with a readability measure of ten, for example, is twice as difficult as another passage whose readability measure is five, or that at least there exists equal increments of difficulty in passages measuring five, ten, fifteen, and twenty in readability. Such a measure would certainly be useful in the sequencing and pacing of children's reading materials.

Read-Ability, on the other hand, refers to the conceptual level at which a child (or adult, for that matter) is able to understand connected prose at a given point in time. More specifically, again, read-ability refers to the measure of this level. It would follow here also that this measure has the properties of an equal interval scale, wherein a growth of five read-ability units from ten to fifteen, for example, occurs at about the same rate for the same student as the growth of five read-ability units from thirty to thirty-five.

For the student, read-ability is not a static measure; it changes over time and, hopefully, changes more rapidly with proper instruction. The readability of the printed word, however, is static, unchanging, at least for any given passage. A correlation between the measure of readability of prose and the measure of read-ability of students would be useful at all levels of instruction. Taking this one step further, where both the measures of readability of prose and read-ability of students are based on the same metric, or scale, would represent a significant innovation both for the teaching of reading and for reading in the content

areas. Finally, the availability of such data is likely to reveal mismatches between students and their textbooks - some of which may be irreconcilable. It is at this point that all teachers must assess and update their repertoires of teaching strategies to include instructional techniques for dealing with such mismatches.

This monograph deals with the problems: 1) of identifying the levels of conceptual difficulty of text materials; 2) of identifying the levels of students' abilities to conceptually understand text materials; 3) of matching the conceptual levels of texts with the conceptual abilities of students; and, 4) of identifying, developing and implementing adaptive teaching strategies that compensate for situations where texts and student conceptual levels do not match.

B. The Problem of Reading in the Content Areas

Reading in the content areas is besieged by a motley of problems beginning with the espoused lack of training in the teaching of reading on the part of content area teachers: Secondary school teachers are not reading teachers. And, it is not likely that secondary teachers will ever become reading teachers. Reading in the content area is all but a myth.

Yet, there in the content areas, for as many as five out of eight periods a day, are students of given read-abilities swamped, unchallenged, or accidentally matched by text materials of unspecified readabilities; all of which amount to students who typically don't understand that which they are required to study, are simply

bored by what they are required to study, or occasionally both enjoy and understand their assignments.

No one could argue that content area teachers shouldn't be more skilled in helping children understand that which they are required to read. But a distinction needs to be drawn here between the responsibilities of the content area teacher and those of the reading teacher.

The content area teacher need not be concerned with component skills of reading such as decoding, structural analysis or literal comprehension. The reading teacher, on the other hand is much concerned with such skills. While the reading teacher rarely has the luxury of seeing the process through to the conceptual understanding of connected prose, this skill is the content area teacher's main concern. This concern can be defined more narrowly: The content area teacher is neither concerned with the teaching of reading nor with improving reading skills in students. Rather, the content area teacher is concerned that students achieve a conceptual understanding of assigned readings at a level either commensurate with students' current capacities for such conceptual understanding (read-ability) or as demanded by the assigned prose (readability). "Reading" in the content area must be redefined as the expansion of the repertoire of the teaching skills of content area teachers to include awareness of and strategies for dealing with the conceptual understanding of connected prose.

C. Purpose of this Monograph

The purpose of this monograph is to review an instructional design which purports to develop, maximize and, where necessary, compensate for students' conceptual understanding of connected prose. This design includes periodic testing for students' "read-ability" (i.e., current levels of conceptual understanding of print material); the determination of the "readability" of assigned print materials (i.e., the level of conceptual understanding demanded by such materials); policies of textbook adoption and assignment; and teaching techniques, strategies and models appropriate to both the formal teaching of reading and to teaching in the content areas.

Excluding teacher talk (Flanders, 1967), upwards from ninety percent of the information students gather is done so via print materials (Shannon, 1982). The importance of either matching these materials with students' abilities to understand them or of utilizing compensatory teaching strategies where mismatches must be tolerated cannot be overstated. These notions already form the basis of state-wide competency testing in reading in at least two states (New York and Connecticut) where the Degrees of Reading Power testing program has been adopted.

The notion of readability as an instructional concept is gaining momentum in public school classrooms as well, with some or all of the components of the readability instructional design reviewed in this monograph being implemented in school districts such as Levittown, New York; Houston, Texas; Chicago, Illinois;

Boston, Massachusetts; and others.

Subsequent sections of this monograph cover: the problems and outlooks of the measurement of readability of students and of text materials (section II); the design of instruction for the purposes of developing student read-ability competence and of developing adaptive instructional stategies in situations o' student/text readabiity mismatches (section III); the implementation of such instructional design and strategies (section IV); and the evaluation of student progress in the conceptual understanding of connected prose (section V)

II. Measuring Readability and Read-Ability

The measure of readability levels upon which the Readability Instructional Design is based has been heralded as a significant innovation in the teaching of reading (Cooper, 1982). The Degrees of Reading Power tests, administered by the College Board, appear to resolve some of the long-standing problems associated with the measurement of reading, both with students and in text materials.

A. Problems in the Traditional Measurement of Student Reading Levels and Abilities

Traditional measures of student reading levels and ability have failed to provide teachers with data that can be used in planning and modifying students' reading instruction beyond the general notions of placement and the identification of isolated skills. And, even here, these measures have proven unreliable. The status and even the concept of readability has been questioned, not only by researchers, but by publishers as well (Maeroff, 1982; Walton, 1982).

1. Standardized Tests: The major deficiency of standardized testing in reading is the lack of any absolute standard. By design, standardized tests are based on the relative standard of the norm population. Metrics derived from such tests, therefore are extremely variable. Grade-level-equivalents (GLE) from standardized tests are particularly misleading (Bauman, 1982; Gunning, 1982). A given GLE does not refer to a specific skill, set of skills or skill level, but simply to the mean of the norming

population. Moreover, most GLE scores are interpolated from the norming dates (actual grade levels and months of the testing of the sample). Such scores are but estimates of reading levels, and, again, are estimates only in relation to the norming population which is itself variable. Grade level equivalents from one standardized test to another have no relationship or comparative value and are particularly misleading for this reason: what appears to be the same measure is indeed not.

Two other problems that are associated with the use of standardized tests in reading are quite intolerable. The first is that measures such as GLEs and percentiles are not equal interval scales. This adds to the relativity and imprecision of these measures and renders them useless in the measurement of learning progress. The second of these problems is that standardized measures of reading fail to test conceptual understanding beyond simple comprehensions such as main idea. The International Reading Association (1980) has formally opposed to the use of standardized tests, and GLEs in particular, for the measure of reading competence and for use in reading instruction beyond the general assessment and placement level.

2. Other Measures of Reading / Isolated Skills vs. Competency: It is true of some standardized reading tests and of most other measures of reading such as tests based on a variety of word lists and criterion-referenced reading tests, that such measures tend to treat reading as a collection of small, isolated skills. The underlying fallacy here, is that the whole is equal to the sum of

its parts.

Reading is not the mechanical sorting out and application of a large number of discreet skills. Whether a child can pick out blends or dipthongs is not the issue. The process is much more complex and, in the end, the reader can either read and comprehend or not. Richard Anderson, of the Center for the Study of Reading at the University of Illinois, has stated the problem quite simply, "We have fragmented the school reading program and much of it takes place in isolation from real reading (Hechinger, 1981)." While the building blocks of discreet skills are important, they have been entirely too much center stage largely due to the efficiency of the available reading tests in isolating these skills and the subsequent reinforcement to teachers and students for their mastery.

B. Problems in the Traditional Measurement and Determination of Textbook Reading Levels

The biggest problem with the traditional measures of readability and the assignment of grade levels to texts is their lack of correspondence to the students in the alleged target population. A text developed and marketed by a publisher for use at the fifth grade, for example, will typically be unsuited for the average fifth grade student. Of even greater concern is the fact that within any given textbook, readability varies greatly, typically the equivalent of as much as five grade levels. The roots of these problems appear to lie in the several traditional methodologies for determining the readability levels of texts. These

methodologies range from ballpark estimates to rigid applications of graded word lists.

Probably the least reliable method is the practice of writing or selecting prose that appear to meet the "interest" level of a target group of students. It appears that the readability within most "interest" materials, however determined, is extremely variable.

A second method of determining readability is by expert review and/or expert authorship; the rationale here being that someone who has taught third grade, for example, is a good judge of what third graders can read. Training work currently in progress at the EPIE Institute in New York indicates, however, that without specific training in readability analysis, in-service teachers are not able to reliably assess the readability levels of connected prose (Komosky, 1982).

A difficult and short-lived method of establishing the grade level of textbooks was the writing of a text around and to include practice in specific reading skills typically appearing in the formal sequence of reading instruction at the target grade level. The effects of this methodology were devestatingly dull, repetitious and limited materials. Moreover, text materials generated by this method generally proved to be irrelevant to the issue of readability due to the necessity of constructing such materials at obvious and inappropriately low readability levels.

In recent years, state-of-the-art readability assessment of texts has been based on various word lists such as Fry, Dolche, Dale-Chall, Spache, and others. The basic concept underlying such

word lists is the commonality or frequency of occurrence of words associated with certain age or grade levels. This frequency may be determined by a survey of texts and books most prevalently used at given age or grade levels and/or by a survey of the oral vocabulary most commonly displayed by children at a given age or grade level and/or by a determination of the mean age or grade level of miscall of each of the various words in a given word list.

There is no doubt that the widespread use of word lists has been effective in establishing standards of age and grade level vocabulary. And, if readability were defined simply as literal comprehension (i.e. the meaning of words), word lists would be sufficient criteria. Readability, however, is something more. It is defined as the conceptual understanding of connected prose. A literal understanding of the meaning of each word in a sentence does not guarantee or imply an understanding of the meaning of the sentence and certainly does not approach conceptual understanding.

C. A Unified Measure of Reading Level

For as long as these various scales and tests have been in use, their major shortcoming has been clear: the measure of the text has had no correspondence to the measure of the student. The solution would, of course, be at once elegant and simple: a student read-ability test and a method of text readability analysis based on the same methodology and scale.

The Degrees of Reading Power (D.R.P.) tests and text readability analysis procedures appear to be one resolution to this long-

standing problem. The student tests, although not timed, takes about 45 minutes to one hour to complete. The results provide three measures of a student's read-ability level: independent, instructional and frustration. The D.R.P. text analysis procedures provide a measure or index of prose readability compatible with the measure of student read-ability.

Matching students to appropriate texts is, of course, simplified via the D.R.P. technology. More important, however, teachers are now able to know whether and to what extent textbooks and other print materials do not match student reading levels. The several teaching strategies reviewed in the Readability Instructional Design herein are designed to deal effectively with situations of text/student readability mismatches.

The Degrees of Reading Power tests do not measure the component parts or the discreet, isolated skills of reading. Instead, these tests measure the point along a continuum of difficulty at which a student currently demonstrates a conceptual understanding of connected prose. The point measured is an absolute point, i.e., an index or point of criterion that does not change. An index score of 55 has the same meaning in New York in 1982 as it will have in Des Moines in 1986; it has the same meaning for Susan and George as it does for the textbook that these students are asked to read.

The College Board (Ivans, 1982) suggests that the D.R.P. be viewed and interpreted as a standard (an index unchanging in a constantly changing world), much in the manner we have come to view and interpret the Scholastic Achievement Tests (SAT). A seven

hundred SAT verbal needs little explanation. The educational community has come to accept the SAT as a standard by which students and even schools are judged.

The SAT, however, is a standardized or norm-referenced test, and, though widely accepted, is at best a relative standard capable of segregating students into higher vs. lower achievers. The D.R.P., on the other hand, has the potential of a true criterion-referenced standard: a standard with objective meaning. A fifth grade student may be expected to understand connected prose at a readability level of 55. This level may be entirely unacceptable for an eighth grade student; the student is expected to grow in his or her conceptual understanding of connected prose. As the child grows chronologically, the D.R.P. ante is raised and the student is expected to understand more difficult reading material. In this manner, the D.R.P. index serves as a constant standard against which student reading progress can be measured.

III. Readability By Design

The basic principle upon which the Degrees of Reading Power tests were designed is old and simple: matching students to appropriate text materials. The D.R.P. provide the technology to make this principle a reality. Many factors, however, will continue to prevent the realization of the ideal of student/text matching.

The greatest initial obstacle to this goal is the financial impossibility of the massive retooling of textbooks which would be required to realize large-scale student/text matchings. It is estimated that upwards from 70% of the textbooks in use in grades three through ten represent mismatches either in whole or in part. Bond, Tinker and Wasson (Gunning, 1982) have suggested that the range of reading achievement at the start of the fourth grade is no less than 1.7 to 6.5 grade level equivalents. Moreover, this range increases through the grades. Such ranges preclude proper student / text matching even where several parallel level texts are used. It is impossible to replace all of these textbooks in any short haul.

The second major obstacle to the ideal of text/student matching is the unavailability of appropriate D.R.P. level materials for perhaps most grade levels and courses. Teachers and students may, at least in the short run, find themselves irreconcilably wed to the inappropriate text materials on hand. A third dimension is apparently necessary: that is adaptive teaching strategies for dealing with inevitable student/text mismatches.

A. A Three-Phase Instructional Design

The Readability Instructional Design assures either an appropriate match between the conceptual levels of students and texts and/or the provision for adaptive teaching strategies when appropriate matches cannot be realized. The design, therefore, consists of three dimensions or phases: 1) student read-ability, 2) readability of text materials, and 3) adaptive instructional strategies. Figure One illustrates the three dimensions of the Readability Instructional Design.

B. Phase One: Student Read-Ability Level.

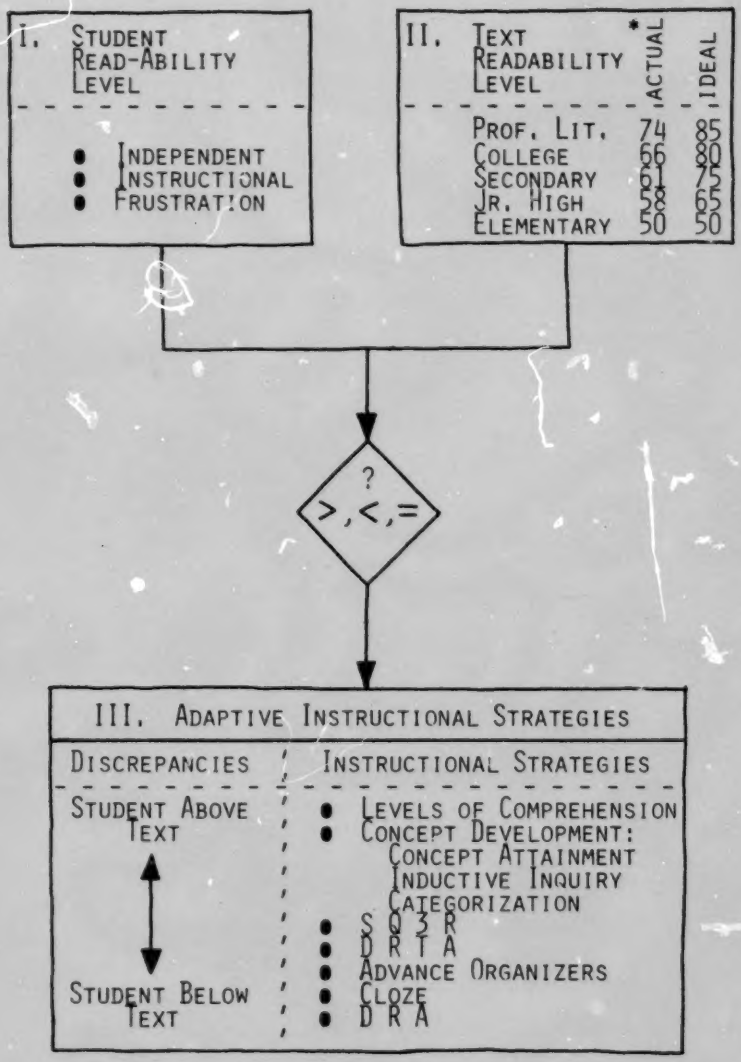
The first dimension of the Readability Instructional Design involves the determination of students' levels of read-ability. This measure is taken for every student, typically grades three through eleven, using the Degrees of Reading Power (D.R.P.) testing program.

The student Degrees of Reading Power tests include sequences of passages of increasing difficulty as determined by the Degrees of Reading Power Readability Index of each passage (see following section re text readability analysis). In these passages, words are omitted according to a modified Cloze technique. Students are given several grammatically and contextually correct choices for the omitted word, one of which fits conceptually into the passage.

For each student three scores or indices of read-ability are derived from the D.R.P. tests: independent, instructional and

FIGURE ONE

READABILITY INSTRUCTIONAL DESIGN



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frustration. The instructional level indicates the range at which a child can read and comprehend print material with the help of a teacher. The frustration level provides a measure of the limit of the student's ability to read and understand even with teacher support. The independent level is a benchmark of the student's ability to read and comprehend without instructional support. This leveling of student reading ability has obvious importance. When possible, print material can be selected to correspond with the reading level of a student, or group of students. When print material cannot be selected or when the same material is available for all students, then teachers have the advantage of being able to know which students can read the material on their own, which students need teacher support, and/or which students, may not be able to read the material under any circumstances.

C. Phase Two: Readability of Print Material.

As stated above, the student D.R.P. tests include sequential passages of increasing difficulty as determined by the D.R.P. Readability Index for each passage. This is, of course, the same readability index which is applied by the College Board to text analyses to derive a "D.R.P. Index" for a given textbook, thus assuring, at last, correspondence between the measure of the text and the measure of the student.

The D.R.P. Readability Index is based on the Bormuth formula and the Dale long list of words (see Figure Two). Neither structural formulae nor word lists, of course, are innovations in text

readability analysis. The Bormuth formula, like most readability formulae, counts the number of letters per word, words per sentence and sentences per paragraph; and the Dale long list of words is similar to at least several others. The D.R.P. technology simply combines the two while allowing for atypical cases. Where structural formulae fail to account for the sophistication of vocabulary and where word list formulae fail to account for structural complexity, the D.R.P. Readability technology considers both structure and meaning.

F I G U R E T W O

COMPUTATION OF TEXT READABILITY USING THE BORMUTH (1967) FORMULA

For passage X, let the number of:

a) letters in passage = LET

b) words in passage = W,

c) Dale Long List words in passage = DLL, and

d) sentences in passage = SEN, then

$$\text{Readability (R)} = .886593 - .083640\,(LET/W) = .161911\,(DLL/W)^3 - .021401\,(W/SEN) + .000577\,(W/SEN)^2 - .000005\,(W/SEN)^3$$

R=proportion of correct restorations DRP UNITS = (1-R)X100

1. College Board D.R.P. Readability Service.

The actual analysis of text materials for their D.R.P. Readability Index is conducted at Touchstone Applied Science Associates, Elmsford, New York. The process involves trained readers who select three random paragraphs each from three to five sections of a text. Each set of three randomly selected paragraphs is subject to a readability analysis. In this manner, a readability index is secured for the text as a whole. Moreover, the readability indices secured for various sections of the text reflect the internal consistency of the text's readability.

The process used by Touchstone Associates is a lengthy but reliable one. Due to the time required for the D.R.P. readability analysis of a textbook and the costs associated with this time, only a limited number of textbooks have thus far been analyzed in this manner. Nonetheless, through efforts of the College Board, the Carnegie Foundation and the State of New York Department of Education, several thousand text and children's literature titles have been analyzed to date.

The resulting D.R.P. indices for these texts are published and updated regularly by the College Board. The readability service provided by the College Board will, through Touchstone Associates, provide at cost to the publisher or any requesting source, a D.R.P. index for any title submitted for analysis.

2. Other Methods of Securing D.R.P. Readability Indices.

At this time, text analysis by Touchstone Associates is the only official method of securing a D.R.P. readability index for textbooks, children's literature or other connected prose. The task of analysis is great, however, and it appears that only about twenty percent of the textbooks typically in use grades three through twelve have had an official D.R.P. readability index completed (Young, 1982). If the Readability Instructional Design and the spirit of the Degrees of Reading Power technology are to be a reality, however, it appears that the industry of education must expand its capacity to analyze text materials a la D.R.P.

It is likely, further, in fact already a reality, that local school district's needs for text readability data will go beyond the data provided by the standard College Board D.R.P. analysis. In Levittown, New York, for example, a readability index was desired for every story in each basal reader grades two through six as opposed to the readability of a basal as a whole as typically provided by the College Board. This information proved necessary because of the great variability in readability levels from story-to-story within a given basal.

Local Training in Text Readability Analysis. The College Board has already considered the notion of training teams of teachers from local school districts in the analysis of connected prose based on D.R.P. technology. Several joint projects with the EPIE institute appear to be headed in this direction.

The training involved for such teams includes skills in Cloze techniques and text analysis using the Bormuth formula and the Dale long list. It appears that reliability of analysis can be obtained with about twenty hours of training (Komosky, 1982).

Back at home in their local districts, the trained D.R.P. teams can secure readability indices on texts or other print materials based on local priorities. In this manner, the local district achieves a high degree of independence in its capacity to develop the data base necessary to assure student/text matching and/or student/adaptive-instructional-strategy matching. The major drawbacks to this alternative appear to be 1) the cost in time for local readability analysis if conducted by teachers on either an extra pay or substitute teacher basis, and 2) the unavailability of reliable, wide-spread training in the D.R.P. text analysis technology.

Microcomputer Text Readability Analysis. A more promising (i.e., more reliable, cost-effective and feasible) method of expanding local capacity to secure conceptual readability indices for print materials is through the use of now-popular microcomputers. The International Reading Association has advocated this application of microcomputer technology for some time as it applies to various word lists and structural formulae (Keller, 1982; Schuyler, 1982). Indeed, a micro-computer version of the Fry word list is now readily available.

The Degrees of Reading Power Readability Index is based on a combination of word list (Dale's long list) and structural (Bormuth) formula analysis (see Figure Two). Several attempts have

been made to duplicate D.R.P. text analysis on the micro-computer. The user should beware of at least two versions which incorporate the Bormuth formula, but only estimate from the passage the number of words that appear on the Dale long list. In tests, this has proven to be a shortcoming which contributes to unreliable results. Any micro-computer text analysis procedure which purports to be compatible with the Degrees of Reading Power tests and analyses must incorporate the identical technology in whole.

Several school districts have attempted to develop local capabilities for D.R.P.-compatible text analysis. In Levittown, New York, a considerable amount of work has gone into the development of a micro-computer program that would read a series of connected prose (typed in via the keyboard); compare each word in the passage to the Dale long list; count letters, words, etc. as per Bormuth formula requirements; and compute a readability index compatible with the Degrees of Reading Power.

Due to the length of the Dale long list, the first version of this program took six hours to run an analysis of a three-paragraph passage on an Apple II micro-computer. The program was rewritten several times, until the analysis ran with integrity (i.e., read the passage, compared the words in the passage to those on the Dale long list, and computed the readability of the passage based on the Bormuth formula), and furthermore ran in under ten minutes, including data entry.

The benefits of this program to the Levittown School District are legion. Via micro-computer text analysis, the district quickly secured story-by-story readability measures for all basal readers

grades two through six. As part of its implementation of the Readability Instructional Design, the district rearranged the prescribed sequence of the basal reader stories so that presentation to students was in a sequential manner from easier to more difficult stories. Elementary and secondary social studies, English, health and science textbooks were analyzed locally in a similar fashion in an effort to secure a data base for matching students to texts and/or implementing the compensatory teaching strategies of the Readability Instructional Design.

The development of local capacities to generate D.R.P.-compatible readability scores is an exciting concept. Degrees of Reading Power evaluations are accomplished by measuring various parts of books; usually breaking the book into five sections and evaluating selections from each of the five parts. With a complimentary readability scale at the local level, readability levels can be obtained for individual stories or chapters. The power given to a teacher by this process is great. The match of student to text can now be very precise to the point of identifying variances from lesson to lesson or story to story. Teachers can choose their methodology based upon hard data and gear instruction to the true needs of students.

D. Phase Three: Compensatory Instructional Strategies.

In addition to the basic strategy of matching textbooks with students based on their respective D.R.P. levels, the Readability Instructional Design incorporates student placement strategies,

strategies for course structure and course design, and specific compensatory or adaptive instructional strategies.

1. Matching Students to Text D.R.P. Levels: A Basic Instructional Strategy

Previous sections of this monograph have dealt with the strategy of matching texts to students in considerable detail. A reemphasis of at least one point is in order here. That is the unit of analysis.

Typically, a readability index of measure is provided for a given textbook as a whole. The Readability Instructional Design takes text analysis beyond this gross measure of the textbook. Teachers need to know student/unit and student/chapter readability matches as well as student/textbook matches. Such knowledge has been valuable in rearranging the prescribed sequence of stories or chapters within textbooks so that the readability of assignments proceeds from easier to more difficult during the course of the year. This strategy is particularly effective in elementary grades where intra-text readability can vary considerably and where sequence of content may not be crucial.

2. Matching Student Readability to Specific Content Area Courses

Placement. Student D.R.P. Level ought to immediately become one of the criteria for determining the placement of students in secondary courses of varying difficulty, where such course structures exist. Such placement could assure that compatible D.R.P. level texts, supplemental print materials and instruction strate-

gies are selected and made available for students of common needs. It should be noted that the use of D.R.P. levels for student placement represents criterion-referenced data as opposed to the discriminatory tradition of norm-referenced criteria for such placement.

Student placement criteria based on D.R.P. levels might take the form displayed in Figure Three. The D.R.P. ranges would, of course, vary from one school district to another. Utilizing D.R.P. levels for student placement within a pre-existing structure of ability grouping could assure both incremental differences between placement levels as well as a flow of students between course levels as individual readability levels change.

F I G U R E T H R E E

D.R.P. LEVELS/COURSE PLACEMENT CRITERIA

	Course Difficulty Levels		
Grade	General Studies	Academic	Honors/Advanced
7	48-57	58-69	70-78
8	51-60	61-72	73-81
9	55-63	64-74	75-85
10	57-66	67-78	79-91
11	60-69	70-82	83-94
12	63-72	73-86	87-98

* (The D.R.P. ranges in this chart are based on 1981-82 testing in the Levittown Public Schools, Levittown, N.Y. N= approximately 650 per grade.)

Course Structure and Design. The course structure in the typical secondary school develops by default. Typically, a sequence of courses is identified (e.g., Algebra I, Geometry, Algebra II, Trigonometry and Pre-Calculus Math) around which a set of advanced courses and a set of slower-paced courses are added. Differences between courses often amount to nothing more than differences in the general levels of ability of the students assigned to them. Movement of students between courses of varying difficulty and the assignment of individual students to courses of varying difficulty in different content areas is rare: That is, such placement procedures often amount to simple tracking.

D.R.P. technology provides a criterion-referenced basis for establishing the secondary course structure, at least in the content areas. A course structure based on the D.R.P. levels listed in Figure Three could serve as the basis for text selection, supplemental reading selection, and, in conjunction with the placement procedures discussed with Figure Three, assure continuous conceptual growth for all students.

Within content area courses a prior knowledge of the D.R.P. levels of students and instructional materials would enable the teacher to properly select and sequence materials. The design of courses would typically include both adaptive instructional strategies (e.g. preview of vocabulary) as well as objectives, questions, etc. dealing with the cognitive levels of analysis and synthesis (Bloom, 1956).

3. Establishing and Monitoring Minimum Readability Gains for Students at Each Grade Level

The frequent monitoring of pupil progress in relation to criterion-referenced standards has proved to be a most effective pedagogical practice (Bloom, 1976; Block, 1976; Carroll, 1963). As a criterion-referenced measure of continuous reading progress, the Degrees of Reading Power Readability Index fills a significant void in the monitoring of student reading comprehension.

Up until now, criterion-referenced measures of reading have fractionalized the reading process by testing on discreted, isolated skills such as consonant blends or vowel digraphs. As Anderson (1982) has indicated, many discrete reading skills have been mastered via this process, yet our children have not learned to understand that which they read.

The Degrees of Reading Power tests do not measure discrete or isolated reading skills. On the contrary, the D.R.P. tests measure the conceptual understanding of prose along a continuum of conceptually simple passages to conceptually complex and difficult passages. The criterion of each test is the conceptual difficulty of the passages that comprise the test. Associated with each passage on each test is a D.R.P. index number which identifies its difficulty along the conceptual continuum. Using these tests to establish criterion-referenced standards is based on the following assumptions:

a) a given passage of prose is comprehensible at a given level of difficulty/complexity;

b) these levels of complexity can be and are sequenced from simpler to more complex/difficult;

c) this sequence of conceptual difficulty can be matched to students of given age/grade levels (i.e., students' ability to understand passages corresponds sequentially to the difficulty of the passages);

d) the correspondence of the difficulty of a set of passages and the age/grade levels at which members of the target population demonstrate an understanding of such passages are the primary reference points for establishing criterion-referenced standards for the target population;

e) once standards have been established in this manner, subsequent students at corresponding age/grade levels of the target population can be expected to comprehend connected prose at commensurate readability levels; and

f) in this manner, students can be expected to comprehend connected prose at increasingly more difficult conceptual levels as their age/grade levels increase.

Figure Four displays just such a set of standards for a typical suburban population. Based on actual D.R.P. testing, expectancy levels have been established for minimum, average and above average reading performance at each grade level three through twelve.

FIGURE FOUR

EXPECTED D.R.P. GAINS/EVALUATION*

	EXPECTANCY LEVEL		
	Minimum	Average	Accelerated
(MAT/OLSAT STANINES)	(1-3)	(4-6)	(7-9)
GRADE 3	40	43	45
4	43	47	50
5	47	51	55
6	50	55	60
7	53	59	65
8	56	63	70
9	59	67	75
10	61	71	80
11	64	75	85
12	67	79	90
	$\bar{X}$=3	$\bar{X}$=4	$\bar{X}$=5

* (The D.R.P. ranges in this chart are based on 1981-82 testing in the Levittown Public Schools, Levittown, N.Y. N=approximately 650 per grade.)

In this particular instance (Levittown, New York), students in the target population are expected to gain approximately four D.R.P. units per grade of schooling. This standard was based on the mean D.R.P. score for each grade in the norming population.

A higher standard is set for students who demonstrate an accelerated reading ability. This standard is equivalent to about five D.R.P. units per grade of schooling, and was determined by the third quartile D.R.P. score for each grade in the norming population.

Finally, a minimum standard of approximately three D.R.P. units per grade level is established for even the slowest performing reading students. This standard was determined by the first quartile D.R.P. score for each grade in the norming population.

The minimum D.R.P. expectancy level for each grade must be interpreted carefully. The minimum standards in any grade is that point which assures some degree of success at the next higher grade of schooling. In Figure Four, for example, a student in grade four scoring 43 D.R.P. units or above in spring testing is assured some success in dealing with reading requirements in grade five. A fourth grade student scoring below 43 D.R.P. units, however, is projected to have considerable trouble in handling most (even remedial) fifth grade printed material. Intensive reading remediation or retention should be considered.

4. Matches and Mismatches: Compensatory Instructional Strategies

Unfortunately, many teachers tend to assume too much about students' abilities (i.e. read-abilities) and as a result provide for students insufficient structure and assistance. Harold Herber (1980) has called this "assumptive teaching." The assumption that

students can read and comprehend the material they are given is a common one by teachers in all grades and subject areas. Such assumptions, can be devastating for students since, as stated previously, print material is very often mismatched to student reading ability. Herber (1980) identifies the following erroneous assumptions that teachers typically make about students' reading abilities:

1) that students have sufficient maturity and skill to handle the assignments;
2) that they have sufficient command of skills to ferret out the significant points on which to report; and
3) that they have sufficient organizational skills to marshall all of the information and present it in coherent form.

Frequently, Herber concludes, structure is lacking in lessons and assignments; students occasionally are uncertain what they are to do; and they are often uncertain how to do what has been assigned.

Where the readabilities of text materials do not match the read-abilities of students (and this may be the case most of the time) alternative teaching skills become acutely important. The teacher must adapt instruction to compensate for these mismatches. Fortunately, a number of such strategies are available to teachers. Several of these adaptive teaching strategies are reviewed here as they apply to both student and text mismatches and to the general development of conceptual understanding of prose in children.

The strategies reviewed herein are not new. In some cases, they represent modifications to existing strategies that have been known to educators for years. All, some, or part of these methodologies have been used by most teachers at some point in their careers. The strategies, if used in a consistent program of

instruction will improve students' ability to read and comprehend information in any subject area that depends heavily on print material.

Some overriding characteristics are common to most of these strategies. One such characteristic is motivation. Perhaps the most powerful of the characteristics, motivation to read and understand can enable a youngster to go beyond his or her expected level and comprehend material that normally could not be transmitted to that child through print material. All of the strategies to be discussed provide a mechanism for developing within the student a motivation to read and understand the material. Most of the strategies are designed to draw from the student's own experiences and backgrounds. Indeed, when such experiences are not sufficient to work with the print material at hand, the strategies require the development of the necessary experiencial background. These strategies ultimately facilitate student study skills. Teachers do not provide sufficient instruction on study strategies (Adams, Carnine and Gersten, 1982). Indeed, Durkin's observations indicated that only 1% of instruction was dedicated to such pedagogy. Instead, time is spent in independent reading, student task completion and teacher requests for recall of material that is read.

Two additional elements are common to many of the D.R.P. adaptive instructional strategies. 1) The first is the development of an understanding of the necessary vocabulary and concepts. The "assumptions" to which Herber refers are often a result of the teacher believing that the students' understanding of vocabulary

and concepts go beyond that which they actually understand. 2) The second is the use of prediction. Asking students to either subtly or overtly predict outcomes causes an integration of skills that is beneficial to the learning process. We have learned from Goodman's (1972) work on Miscue Analysis that children are often predicting as an integral part of their reading style. Students who process print material using predications, at first look, tend to make mistakes similar to less able readers. However a closer look indicates that their miscues are really accurate predications based upon semantics and syntax. While substitutions are made, the understanding of the text is clear. Students are making accurate predictions based upon the integration of what they have already read with their own background. The random substitutions maintain meaning and syntax and do not require correction, (Page & Pinnell, 1979). The mechanism of prediction is fostered by the D.R.P. compensatory instructional strategies.

Interestingly, the higher levels of Bloom's Taxonomy are incorporated in many of the strategies. Posing questions at all levels of Bloom's hierarchy is important, but choosing the higher levels of questioning for specific cases of text/student mismatches is an important feature of many of the strategies. Use of higher cognitive levels is necessary for both advanced and slower readers. Emphasis should be placed on using higher cognitive levels for material that is below a student's instructional D.R.P., whether the student is remedial or advanced. Higher level questioning, as will be seen, can also be used for follow-up questions for all students when they are working at their instructional or

independent levels after literal comprehension questions have been posed.

a) Cloze Techniques

The Cloze reading procedure is a significant characteristic of the D.R.P. that is not common to other reading tests. The modified Cloze procedure used in the D.R.P. is a variation of the original technique established by Wilson Taylor (1953). The application of John Bormuth's (1967) formula has turned the technique of the Cloze into a readability scale. It is not surprising, then, that Cloze be the first instructional technique to be addressed in this monograph.

A pure Cloze approach would be include the deletion of every n^{th} word in a passage. A modified Cloze approach deletes selected words rather than using the n^{th} word approach. The D.R.P. test deletes seven per every 325 words. The deleted words are not chosen at random. Rather, deletions are made so that the text of the passage must be read and understood for the student to respond correctly. For the purpose of using Cloze as an instructional tool in all subject areas, it is suggested that the deletions be selected by the teacher with the purpose of probing for the specific comprehension of content and concepts.

There is evidence that even general Cloze activities will transfer to improved comprehension in specific content materials. (Jongsma, 1980). Therefore, any and all cloze activities should have some impact on instruction. Cloze activities specific to the

material at hand will have even greater impact. Modified Cloze activities seem appropriate for all grade levels. Such instruction should be accompanied by teacher discussion of the prose that was read. Modified Cloze materials are more effective if they are sequenced for length and difficulty and are matched to the student's reading abilities.

Teachers can utilize a procedure to check the appropriateness of materials for the students to whom they are assigned. This activity utilizes the cloze procedure and therefore provides a validation of the applicability of the cloze items as well. The procedure is borrowed from John Bormuth (1967):

> A step by step description of this process includes these steps. (a) Select several passages from a book, say from six to twelve, using some random method for selecting the passages. Each passage should begin at the normal beginning of a paragraph and each should be at least 250 words in length. The test, for reasons of both convenience and test reliability, should contain exactly 50 items. (b) The tests are then given to students at the grade level at which the text is most commonly used, 25 to 30 students are usually enough to obtain reliable results. (c) The mean score on each test is calculated and then the mean of the mean scores is calculated. (d) Finally, the test whose mean score is closest to the mean of the entire set of tests is selected and the rest of the tests are discarded. (e) When a test has been selected for each of the texts a teacher is likely to use, the tests can be mimeographed and compiled into booklets which can be administered as group tests. When a student's score falls between 44 and 57 percent on one of these tests, the materials are at the level of difficulty thought to be suitable for use in his supervised instruction. Materials on which a student's score is above 57 percent are suitable for use in his independent study.
>
> The reliability of this procedure depends upon four factors. First, if longer tests are used, the students' scores will be more accurate, but the tests will also require more time to administer. Second, if a larger number of tests are made when selecting the test to represent the materials, the test selected will more accurately reflect the difficulty of the materials. If the tests are to be used frequently, it is probably

worthwhile to select the test from a larger number of tests. Third, some materials vary unevenly in difficulty as they proceed. These materials are poorly constructed and their use should, if possible, be avoided. Fourth, the procedures outlined for constructing, administering, and scoring the cloze tests must be followed exactly or the results will be meaningless.

An understanding of the process by which effective readers process these deletions is the key to the value of Cloze for mismatches at both ends of the readability scale. Good readers use backward and forward searching behaviors very effectively. Furthermore, such readers can use real world knowledge about the networking of the relationships about which they are reading. They also use letter cues and make logical predication based on their monitoring of the prose. When using Cloze with youngsters who are in material that is too difficult for them, it behooves us to help them to learn to seek answers by; (1) searching backward and forward, not to neighboring words but to neighboring concepts, (2) relating text to their backgrounds, and (3) helping them to predict. Deletions and their supporting instruction can be effectively geared to helping students who are below the D.R.P. of assigned materials to master these skills and thus improve their reading ability. The student above the D.R.P. of assigned materials should have the deletions geared to supporting these skills while refining them to deal with higher level cognitive skills. Students above the D.R.P. of assigned materials would benefit from deletions of highly technical terms that can be found in other parts of the text. Students below the D.R.P. levels of assigned materials require deletion of more common words leaving the technical words (especially in secondary subjects, such as

Science and Business) intact. Below D.R.P. students may require aural as well as visual formats. This is especially true at the elementary grades. Below D.R.P. students would benefit from having multiple choices for the deletion even to the extent of being given the first letter of the deleted word. Above D.R.P. level students would benefit from having to supply the deletions from their own knowledge. Multiple choices would not be necessary for the above D.R.P. student, however synonyms should be accepted. Cloze techniques should always be used as part of a total instructional package and not as the only technique.

b) Directed Reading Activity

While the Directed Reading Activity had its genesis as a developmental reading technique, this instructional technique also provides strategies for integrating and applying previously acquired skills in the content area. Nelson and Herber (1981) suggest "Because some students have difficulty in making this transition, it is assumed that they lack the basic skills." Nelson and Herber conclude that although this process may lead to increased focus on skill oriented reading tasks, it generally fails to solve the problem of integrating and transferring skills to the increasingly sophisticated reading tasks assigned in content area reading classrooms.

The Directed Reading Activity is based on the establishment of a purpose for reading. This is achieved by extensive preparation in the development of background information about the

text to be read. This approach is particularly effective when dealing with material that is on the D.R.P. instructional level of students, and with some modification when the material D.R.P. is above the student D.R.P.. Much of the preparation is designed to provide experience with new vocabulary that is critical to the understanding of key concepts. This is done by making the students familiar with the key words and by providing strategies that help students process these words as they exist in the intricacies of the text. The importance of background information as explained by Adams and Bruce (Nelson and Herber, 1981) should be noted:

> To say that background knowledge is often used, or is useful in comprehending a story is misleading. It suggests that a reader has the option of drawing on background knowledge to enhance the comprehension process, but that he or she might just as well do without such frills -- as if there were a reading process separate from the drawing-on-background-knowledge process.
>
> In fact reading comprehension involves the construction of ideas out of pre-existing concepts. A more correct statement of the role of background knowledge would be that comprehension is the use of prior knowledge to create new knowledge. Without prior knowledge, a complex object, such as a text, is not just difficult to interpret; strictly speaking it is meaningless.

We must recognize that the transition from reading materials containing common words and familiar concepts to content area textbooks containing uncommon vocabulary and unfamiliar concepts involves a change in the reading process from recognition of known words to acquisition of new words, from reconstruction of meaning out of experience to creative construction of new meanings and new experience. This process involves reasoning: reasoning from what is known to what is new; reasoning in, around, and beyond the text material. (Nelson & Herber, 1981)

The setting of background involves both the diagnosis of what a student knows and the concomitant introduction of what he/she needs to know. Upcoming readings can be related to material which has been previously read or currently being discussed in the class. Whenever possible a bridge should be made to relate the material to the student's personal experiences. Students with D.R.P. levels below D.R.P. rating of the material being read will need extensive preparation here. They would profit from as many audio-visual stimuli as possible. These youngsters may also need the support of graphic organizers. As the setting of the background unfolds, the introduction of key vocabulary words becomes important. Teachers need to be careful not to overburden the students with every new word but to focus on those that are critical to the understanding of the concepts embedded in the prose material. Dictionary type definitions are not appropriate since their purpose is not to improve word recognition skills but to foster the understanding of relationships that occur in the text. The student with a D.R.P. below the text material will need special help here. Time should be spent explaining the syntatical relationships to be found in the text. Advanced organizers such as the "script" or setting of the upcoming material should be made clear to students. This of course reverts back to the setting of the background. While a fifth grader might think that a "Bear in the air doing flip flops" is an animal doing aerial acrobatics, a CB'er knows it is a police helicopter flying up and back over a stretch of road. To fully understand this, the understanding of the technical vocabulary and

the context of the message must reside in the reader's realm of experiences.

Prior to the actual reading of the new material a clear purpose should be set. The greater the disparity between text and reader D.R.P. the more precise the purpose should be. Do not expect comprehension if the students are told to read the material because "it is important to know." Instead specific directions should be given. Suggested purposes would include the sequencing of events, proving or disproving statements, comparing or contrasting, locating information, establishing cause and effect, classifying information, establishing fact from fiction, choosing titles etc.

At this point the actual reading can now take place. Texts-matched to students can be read without much teacher intervention, even for homework. Students whose D.R.P. levels are much below the text material still need teacher support. Often the first paragraph or page (in a long selection) can be read by the teachers. This oral reading serves as an advanced organizer to help the students to begin to understand the "script". While silent reading is usually suggested for well matched students, oral reading may be necessary (by teacher or student) for the poorly matched youngsters. The oral approach often helps them to understand words that are familiar when spoken but foreign when first read. Certainly, an occasional vocalization by a student whose D.R.P. is substantially less than the D.R.P. of the print material he/she is in should not be discouraged. Once the material has been read by the student an actual processing of it should be

undertaken with the teacher leading the discussions. This discussion should focus on the purposes established for the reading. Items omitted from the purpose setting should not be discussed. A re-reading in part or whole is an effective use of redundancy. Oral re-reading may be necessary to check the reading comprehension of some of the students and to support or refute the information brought into the discussion. After the re-reading follow up activities are necessary and worthwhile. It is at this point that items that surfaced in the discussion but not set in the purpose can be pursued. Refinement of new concepts introduced in this material can also be undertaken. Homework, class projects, tests, discussions etc. all are appropriate. Non print activities such as the design of posters and models, dramatizations, debates, etc. are very appropriate. This provides reinforcement through various modalities.

c) SQ3R

A teaching approach called SQ3R (Survey-Question Read-Recite-Review) can be an effective method of assisting children to obtain information from print material. It parallels the Directed Reading Activity in that the students are trained to do what the teacher does in the Directed Reading Activity. SQ3R seems appropriate for youngsters in the upper elementary grades when their D.R.P. level is the same or above the print material they are using. This is not a technique that is likely to be successful when youngsters are working in materials that are above their own instructional D.R.P..

SQ3R is, in essence, a self paced, self directed approach to the Directed Reading Activity. Instead of the teacher controlling the work, the student works independently. The SQ3R method should be implemented gradually, moving from DRA to SQ3R when possible. This strategy developed by Robinson in 1931 (Adams, et al, 1982) is prototypical of a number of study skill approaches.

Once the topic of the material to be introduced is understood, the student should go into the survey part of the lesson. He/she should look through the text and use the graphic guideposts as advanced organizers. Bold face type, pictures and captions, charts, maps, topic sentences and summaries should all be scanned. From this the student should be trying to establish the relevant concepts of these upcoming "scripts".

After the survey, the student then has to predict the content of the material by posing questions relevant to the sub-parts (topics, paragraphs, etc.) Student questions should relate to concepts in the print material that are addressed by the survey. Student questions should also seek to find explanations to key words that were identified in the survey. These questions should be written down and will serve as a study guide for the reading that is to follow. A good technique is to write the questions on the left half of a page leaving the right half for the answers.

The student should now begin in-depth reading. Material can be read either in total or by section. The purpose here is to find and write the answers to the questions which the student has posed. Emphasis should be placed on finding important facts and understanding concepts. A strict word by word reading is not essential.

If questions cannot be answered they probably will require further research using another source or the explanation by the teacher.

At this point in the exercise, a recitation of the answers to the questions is important. This recitation should be oral so that the student can hear the answers. The written answers should not be consulted; rather, the student should be encouraged to give the answers from memory. If the student cannot answer the question, he/she should review the written answer until all the questions can be answered orally without the help of the written work. The recitation, then, is a self-testing exercise.

The review of the material needs to occur over a period of time if its full impact is to be reached. The immediate review should include a scanning of the study guide. Key points from the study guide should refer the student back to the text for specific citations. A written outline from memory should be produced by the youngster. Students should be assisted in asking themselves some higher level questions (application, synthesis, analysis). Subsequently, less detailed reviews should occur about one day and then one week later.

d) Directed Reading/Thinking Activity

A Directed Reading Thinking Activity (DRTA) is an extension of the Directed Reading Activity. It is, however, somewhat different in its approach. It emphasizes the relationship of concepts in the print material. It requires students to function more consistently at higher levels and should not be used when the student's

D.R.P. level is below the D.R.P. level of the text. The DRTA is especially effective for material that is at the student's D.R.P. level. Material below the student's D.R.P. level may also be used.

The DRTA requires even greater emphasis on preliminary work than does the DRA. Focused discussions to establish the interrelationships among the text's concepts is essential. Such kinds of relationship (e.g. whole-part-whole, cause and effect, sequencing and chronologies, comparing and contrasting) need to be familiar to the student. Exploring and setting backgrounds is still important. With the DRTA higher level questions need to be emphasized even more so than with the DRA. In addition, syntatic features need to be understood along with features such as the rules of discourse. The purpose of this extensive preparation is to enable students to interact with the text or themselves. Once the reading starts, the teacher's role in the DRTA is not similar to the DRA. In the latter, the teacher comes between the student and the text. In the DRTA, the students need to interact directly with the print material.

Once the teacher has set the preliminary background, the student begins to take over the conduct of the lesson. The goal or purpose of the reading is set by students who will apply their understanding of the concepts that are in the text. Instead of responding to questions taken from an instructional manual or posed by the teacher, the student will develop his/her own key questions to be answered. This is similar to the process in the SQ3R technique. The teacher can assist in the question setting. These questions should not be geared to the finding of facts. They

should be designed to help the student develop a strategy of inquiry and hypothesis testing.

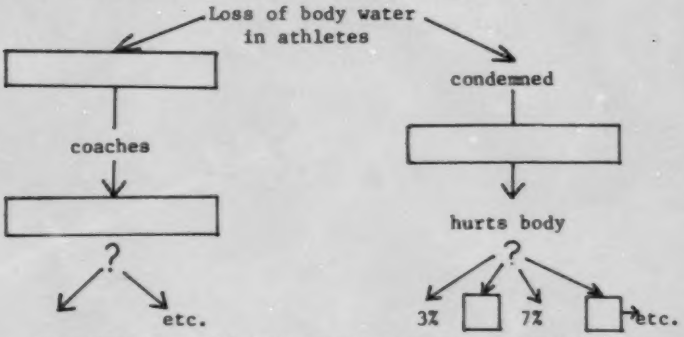
Of particular importance in the use of this technique is the preparation of the student in the use of information around him or her. To help in the student's development of key questions, the use of graphic organizers has been shown to be an effective tool. Even when students can find detail, they tend to lose the impact of concepts. Students tend to read all types of materials in the same way (Vaughan, 1982). They cannot understand concepts in relation to one another. Further, they cannot implement the "implicit links" and ties that are required for comprehension when they lack an awareness of concepts and text structures. Graphic organizers help students to overcome some of these problems. These visual maps of the concepts and relationships in print material can take many forms.

As students become adept at developing graphic organizers, teachers can expect some sophistication. However, at the start simple techniques are encouraged. "Information organized by a simple listing is comprehended better and retained longer when students reorganize it. (Alverman, 1982)."

Alverman (1982) recommends the following procedures for using graphic organizers in the restructuring of prose materials.

1. Peruse the portion of text the students will be reading to determine if its primary organizational pattern is simple listing. That is, does the author make a general statement and then support it with a number of specific statements listed in no particular order?

2. Use key words from the text to construct a graphic organizer for the students that reflects either a comparison/contrast or a cause/effect relationship among the terms. For example, in the following partially completed organizer, randomly listed facts about the loss of body water among athletes (Meyer, 1977) have been reorganized to show a comparison-contrast relationship.



3. Note that you will omit certain terms, replacing them by boxes, in order to encourage students to process the text in their search for missing information.

4. Tell your students that you are going to demonstrate a procedure which can help improve their comprehensi and ability to remember what they read.

5. Involve the students in an activity that requires them to compare and contrast two items, e.g.., apples and oranges. Demonstrate through word associations how remembering the color (or shape, texture, taste) of one fruit usually triggers the recall of a similar characteristic of the other fruit. Point out that the strategy that they will learn to use is analogous to this comparison/contrast activity.

6. Display an overhead transparency of the graphic organizer you produced in step 2. Remind students to keep the comparison nature of the organizer in mind as they read their textbook assignment. Tell them that remembering key terms from the organizer will help them to identify and later recall contrasting terms from the textbook. Emphasize that the procedure involves a mental (as opposed to paper and pencil) filling-in of the organizer's empty slots.

7. After sufficient exposure to the organizer, turn off the overhead projector. Restate the purpose of the strategy, and then instruct students to read the textbook assignment.

8. Recall may be in the form of an open discussion in which students describe how the organizer helped them to comprehend and retain certain information. Or, the teacher may prefer to have students produce written recalls before discussing the usefulness of the strategy.

Discussion is critical to the success of the graphic mapping. Such discussion not only helps with the specific work at hand but also makes students more sophisticated in their successive use of the technique. The discussion may help students to see concepts and trends in a new light or way that students do not normally perceive material. The discussion serves to crystalize the effect of the graphic organizer and finalize the directed Reading Thinking Activity.

The student whose D.R.P. level is below the D.R.P. level of the material will not benefit much from the DRTA. The extensive involvement of higher level thinking skills precludes a below text D.R.P. reader from being able to capitalize on the strengths of a DRTA and the associated graphic organizers. However, an adjustment in the type of graphic organizer can give the below the D.R.P. student great benefit. For these youngsters, a study guide is of great value.

In a study guide, the teacher lists very specific questions for students to answer. Many, but not all, of these questions are at the knowledge and comprehension levels on Bloom's heirarchy. The questions are designed to lead a student through the text material. Patton (1981) suggests procedures like the following

example as a study guide for students who may experience difficulty with reading assigned text material.

e.g.: Read p. 311 VERY CAREFULLY. This is a very nice overview of the whole chapter. There are 5 sections on this page that will be useful to you.

1. Notice the two key concepts for the chapter in the chapter title (blue). Write them below and write a definition of each in your own words.

   _____:

   _____:

2. The time period to be discussed in this chapter is given (red). It is _____to_____. (Note: You will notice that the first section of the chapter is all about events before 1845. After you read that section, see if you can tell why it is important to that time period).

3. Read all five paragraphs carefully. This section will give you flavor of the period you're going to read about Do you find any indications of sectionalism in this?

   _____

   What?_____

   _____

4. "The Chapter Outline" is just that. Note each topic to be covered. Can you tell where the chapter is leading?_____

   _____.

   From this outline, it appears that the materials may tell you events leading to a _____ between the North and _____.

5. Look at the time line. This shows you graphically the time period to be considered. The time period would be _____.

While not a true DRTA, the use of a study guide is very helpful to youngsters whose D.R.P. level is substantially below the material they are reading.

e) Categorization and Concept Development

The processes of categorization represent higher level thinking skills that are of prime importance in developing strategies for understanding concepts found in print material. Sorting through data, placing importance on relevant information, and discarding unimportant information depends upon the readers ability to interact with the data and categorize the concepts in that data. These thinking skills occur sequentially and can be taught through selected teaching strategies (Taba, 1964). Once these preliminary steps to concept development have been undertaken, the student is ready to work at the highest levels of Bloom's hierarchy.

The Degrees of Reading Power tests measure skills necessary for concept development and gives teachers an understanding of how much preliminary work needs to be undertaken to achieve an understanding of concepts. Once at the concept level all students can interact with these higher level approaches. In actuality, the skills measured by the D.R.P. involve some information processing that will eventually permit categorization. The New York State Education Department (1979) has advocated many of these information processing techniques including sorting and grouping, using common characteristics, noting differences and likenesses, comparing and contrasting, distinguishing between relevant and irrelevant attributes, identifying examples and non-examples, recognizing relationships, paraphrasing, rearranging order, locating detail, outlining.

Through background setting, introduction of vocabulary, the use of prediction, and other preliminary techniques all students

can be brought to the level where they can interact conceptually with print material no matter where their D.R.P. match or mismatch may be. In a sense then, the D.R.P.'s impact can be a motivating factor that will help bring all students to the highest levels of cognitive interaction.

As students begin to approach a level of conceptual understanding, two instructional strategies become particularly appropriate. Both of these inductive strategies that help students take specific facts and information and draw broad conceptual understandings from them. One is the Inductive Inquiry Method developed by Hilda Taba in the 1960's. The other is the Concept Attainment Model developed in the 1950's by Jerome Bruner, Jacqueline Goodnow and George Austin. More recently Bruner has become singularly associated with the process.

Inductive Inquiry Model. Taba saw the role of the teacher as that of assisting in "the process of internalization and conceptualization by stimulating students to perform complex mental processes and offer progressively less and less direct support (Taba, 1964)." She saw this process as being sequential and conducive to classroom instruction. As the process unfolds, three distinct tasks become apparent: 1) concept formation, 2) interpretation of data, and 3) application of principles.

In Concept Formation, the teacher is concerned with three activities:

1. Identification and enumerating data that is relevant to a problem,
2. Grouping of material on the basis of similarity,
3. Developing names or labels for these categories.

Elicitation-type questions are necessary for teachers to pose for each of these three activities. Such questions as "what was seen," "which items belong together," and "devise a name for this group" help students to expand the conceptual system they employ to process information.

The second task involved in the inductive inquiry approach is the Interpretation of Data. Eliciting questions by the teachers would require students to:

1. Identify characteristic points,
2. Explain items of identified information (Cause and effect relationships), cause.
3. Draw inferences.

These eliciting questions are part of a group discussion format. Correct answers are not as important as much as thought provoking situations that will help students to come to conclusions based on the inferences they have drawn.

The third part of Taba's method involves the Application of Principles. The activities involved in this phase include:

1. Predicting Consequence, Explaining Unfamiliar Phenomena and Hypothesizing,
2. Explaining and supporting the predictions and hypotheses, and
3. Verifying the prediction.

In this phase of the Inductive Inquiry Model, students are aided by the teacher in understanding the conditions under which the hypotheses would be true and to defend it against attempts to discredit it.

Taba's model is not as simple as developing eliciting questions for all phases of the process. Content has to be carefully sequenced so that all the necessary background information is available to students. Often, concrete examples of the desired concepts need to be reduced to yes (that is the concept) or no (that is not the concept) statements. However, once the teacher and the class become familiar with this teaching model, it has great value in permitting students to function at conceptual levels and to develop their own processes for dealing with other information at other times.

Concept Attainment Model. Bruner's Concept Attainment model (Joyce & Weil, 1980) takes the Taba strategy a bit further. It centers not only around students' abilities to form concepts, but on the grouping of these concepts through similarities or differences (a popular theme of Bruner's). The Concept Attainment model stresses the levels of analysis and synthesis in Bloom's heirarchy.

This strategy allows all students to manipulate and effectively use information around them. Its benefit to students includes the reduction of the complexity of the environment; a means of identifying or categorizing objects in the world; and a reduction in the need for constant learning. For example, once a student has learned what an airplane is there is no need to rediscover this fact. An unknown vehicle would be compared with the identifying properties known to belong to the airplane category and the decisions would be reached as to the appropriateness of this particular vehicle to the airplane category. The student is comparing and contrasting the attributes of the item in search of similarities. This is definitely a higher level process. At the same time backgrounds are being set by exploring the particular properties of the items being categorized.

Within the Concept Attainment model there are six elements of a concept that need to be understood. They are:

1. name
2. essential attributes
3. nonessential attributes
4. positive examples
5. negative examples
6. rule

In planning to teach through this model it is important that the teacher can analyze the concept that is to be taught for its essential elements. Since this is a guided discovery type of activity, the teacher must be familiar with the concepts and needs to carefully choose material to attain these concepts.

The first element of importance is the name or label given to the concept. It is important that the name be specific enough to describe the desired concept while broad enough to include all examples of that concept. Compare, for example, the concept of "ghetto" with "neighborhood." While they have some characteristics in common they clearly have differences.

These characteristics are the essential attributes of the concept. Essential attributes represent the characteristics that cause us to place dissimilar items in the same category. The wall around East Berlin creates a ghetto. Socio-economic factors create a ghetto. Political boundaries can create ghettos. While some neighborhoods would qualify as ghettos, others would not. The nonessential attributes would represent those aspects of neighborhoods that do not qualify them as ghettos. The presence of a preponderance of people from one ethnic group may or may not create a ghetto. If the ethnic factor constrains the residents from leaving the neighborhood, then it would be an essential attribute of a ghetto. If it doesn't then, while an essential attribute of a neighborhood, it would be a non-essential attribute of a ghetto.

Often it is hard for students to distinguish between the subtle difference of essential and non-essential attributes. To help students do this teachers will need to present "examples," both positive and negative of the kind of concept the teacher is aiding students to attain.

As they are presented with the various positive and negative examples students are guided in a categorization activity that is designed to help them interpret the "nature of concepts". The

student is constantly formulating an hypotheses and reevaluating it in light of the information presented by the teacher. This process will go on until the student can formulate the "rule" about this concept. The arrival at the rule represents the final element in the process. The student should be able to offer a statement as to the specific attributes of the concept. The rule is a synopsis of the process that led to the understanding of the concept.

When planning for this activity it is important to recognize that there are three different types of concepts. Therefore, if you want students to obtain a specific type of concept it will be necessary to choose examples that are conducive to learning about that type of concept. Bruner described Conjunctive Concepts as those that have the joint presence of several attributes. Disjunctive concepts require the presence of some attributes with the absence of others. Blonde girls who are not tall and tropical storms that are not cyclones are disjunctive in nature. Relational concepts have a number of attributes that are symbiotic in nature and maintain a particular kind of relationship to one another.Cause and effect situations would generally fit into the relational category. The dangers of alcohol and driving would be relational.

The precise approach the teacher takes is not as important as the philosophy underlying the attempt. Presentation of information containing the desired concept(s) is made by the teacher. The information is parceled into pieces of information. Each parcel is identified as being an example of the concept or not. As the positive or negative examples unfold the concept attainment should occur. The commonality of the attributes of the various concepts

should guide the student to see the specific concept the attainment exercise is designed to develop. Students need to write down a record of their own thinking during this process. The process is at least as important as the end result. Students can attain the concept in one of two ways. The positive and negative examples can be directly pointed out to students or they can figure out the concept related material themselves.

At this point the teacher needs to understand the subtle difference between concept attainment and concept formation. Attaining the concept that the author implies is a result of the interaction between the reader and the prose. To reach that mutuality of understanding the reader must bring to the exercise a number of already formed concepts from which he/she will choose the one the author is trying to explain. The process of concept formation should already be in the realm of understanding of the student. In a general way this is analagous to the setting of backgrounds. From the already understood concepts the student will choose the one(s) intended by the author. The process goes on comparing and contrasting the concepts he/she is familiar with until a sameness of thought is reached with the author.

For the properly matched student and the student with a D.R.P. level higher than the text, concept attainment is a very appropriate teaching technique. For the youngster with a D.R.P. level below that of the text's D.R.P., greater emphasis needs to be placed on developing the backgrounds necessary for this reading. In this case, the background setting is synonymous with concept formation. Teacher emphasis on backgrounds is of paramount

importance for the below D.R.P. reader. It does, however, permit these students to be able to function with the classmates using the same print material given a reasonable span from the D.R.P. of the print material down to the student's D.R.P. As all students become familiar with the Concept Attainment technique, the teacher can move from the positive and negative example approach to letting students ferret out the concept-relevant material his/or herself. In this manner, fundamental concepts of a prose dialogue become very understandable to students who use the Concept Attainment approach.

f) Levels of Comprehension

Levels of Comprehension is a technique for the use of print and other materials that is usually attributed to Harold Herber of Syracuse University. Herber's approach is to get students to examine the various levels of information in the materials. The statements posed for these levels are used much as the other structuring techniques already discussed in this monograph. That is, as preparation before the reading, as well as during the reading. Again, the value of establishing backgrounds comes into obvious focus. The levels are defined through various statements presented to the students. These statements set the purpose of the reading as students test their validity.

Herber's (1980) original work listed three levels of comprehension; 1) literal, 2) interpretive, and 3) applied with the critical level being added by the practitioners of the strategy.

These levels can be equated with the cognitive levels of thinking described by Benjamin Bloom in his heirarchy of objectives as illustrated below:

Herber's Levels of Comprehension	Bloom's Taxonomy of Educational Objectives
Literal level	Knowledge
Interpretive Level	Comprehension
Applied Level	Application, Analysis, Synthesis
(Critical)	Evaluation

One of the great values of using this strategy is that it is appropriate for all students whether they are properly matched to their print material or mismatched at either end of the readability, read-ability continuum. Levels of Comprehension does require that students of various abilities interact with one another while responding to the structured statements at the various levels. This strategy, to be effective, necessitates that this interaction occur in small group discussions. Without discussion the strategy will not be effective.

The experienced educator may raise some concerns with the Levels of Comprehension approach. Preliminary tries using the guiding statements may encourage students to read for only the information necessary to support or reject the teacher developed statements. Initially this may be true. Once students become familiar with the approach, they will realize that such searching for selected facts on the literal level only frustrates

them when they have to respond to statements at the other levels of comprehension. The alternative of presenting the statements after the reading, is no more than the business as usual approach that ignores the whole concept of setting the purpose for reading. Other common concerns involve the misapprehension that poor readers will have difficulty with the higher level skills. Herber, however, suggests that:

> Most poor readers can reason with some adequacy, even though they are not skilled in reading. They should not be excluded from educational experiences that require them to use their reasoning abilities merely because they are having reading problems. Guiding students through all three levels makes the inclusion of such students possible. (1980, pg. 48)

Indeed, it seems that while we usually come back to Bloom's concept of a hierarchy of skills, the higherarchial nature of the levels of comprehension does not mean that interpretive can only occur after literal and applied only after interpretive. In reality, the order can go in a number of directions. In some cases, a skilled practicioner will begin to see overlays from one level to another. Bloom purists may wonder why his level of evaluation has not been addressed by Herber. One can only conjecture on this. Perhaps Herber saw, as do many others, that evaluation was not really part of the higherarchy but a process that is ancillary to all levels up to and including synthesis. Similarly, a critical level has been developed for the Levels of Comprehension. This level is a follow up to the other three.

The literal level is geared to what is actually said in the material whether it be in print or media formats. Bloom called this the knowledge level. Often students have difficulty at this

first level. They tend to be unable to discriminate between what the author said and their own feelings or beliefs about what the author meant. Statements developed at the literal level, and given to the students prior to their involvement with the material (reading) will help to focus in on exactly what is said by the authors. Students should be required to support the literal level statements by citing the material in the text that provides the specific information. Emphasis should be placed on giving the students the guiding statements before the reading (setting purpose). Teachers often become aware of the fact that students tend to remember what they think they read and not what they actually read. Structuring literal level statements will help to overcome the student's lack of focus on literal material.

When helping students with literal level material, teachers are seeking recall of facts. In the classroom discussion, student's attention should be drawn to pictures, charts, graphs and any other graphic organizers. Such organizers help to pick out facts. Vocabulary should be dealt with in context. Having students learn meanings from the text will have greater impact on their understanding and processing the conceptual interrelationships than a dictionary approach would have.

At the interpretive level, students need to find out what the author means by what is stated. The pivotal concept is the interpretation of the author's meaning depending on information from the text without the need for other sources. The interpretive material may not be specifically stated but is implied and can be

supported by literal level facts. Interpretive levels of comprehension require students to look at internal relationships.

> They need to develop a sense of how one sorts through information, searching for logical relationships, and a sense of how to express clearly the idea or ideas inherent in that set of relationships. If students are having difficulty with their reading comprehension, their problems may be at the interpretive level. They need to be shown how to read successfully at this level. Merely asking them the question, "What does the author mean by what he says?" is not sufficient. They must be shown how to perceive the possible meanings. (Herber, 1980, pg.46)

The teacher should recognize that at the interpretive level the range of responses can be a wide one. While seeking implicit understanding of the author, the fact is that some previous learnings creep into the interpretation of the text material. This cannot be avoided, but can be turned into a learning experience where teacher and students can learn from the experiences of others.

Statements developed by the teacher at the applied level should be designed to help the students develop broad generalizations about the material they have read. The generalizations or principles are developed with the help of information obtained from previously learned material. The interactions of the ideas from the outside sources with the specific reading assignment leads to understandings that are greater than either individual set of ideas. If the broad generalization cannot be linked to the specific learnings from the text or the experiences of the reader, then it is not at the applied level. Using print material at the applied level satisfies the broad definition that reading is thinking using printed symbols. This type of thinking activity helps to overcome the irrelevance that many students associate with

school. Uniting the students' own experiences with the assigned reading brings the students' interest actively into the material presented by the teacher. Applied level activities are therefore necessary to insure student interest.

Critical level statements should be designed to test the validity of facts, concepts or principles from the other levels. This testing should go on as a follow up to the prescribed reading. Critical level activities are, therefore, the only ones that are not presented before, and discussed during, the reading. They represent important follow up activities that require the use of secondary sources. This research should be directed to support or refute facts, test hypotheses and find contradictions in the other levels. Eventually, this new information could become part of the students own experiences and be a part of another Levels of Comprehension exercise in the future.

g) Selecting and Matching Instructional Strategies

As Bruce Joyce (1980) suggests, it is not a difficult matter for teachers to learn new and various instructional strategies. Implementing such strategies in an effective and purposeful manner, however, requires some prescriptive forethought. It is clear that a given situation of student / text readability mismatch (e.g., when the student's readability level is below that of the text) requires either different or modified teaching strategies than another situation (e.g., when the student's readability is at or

above that of the text). It follows quite reasonably, if not as clearly, that specific of the adaptive instructional strategies are suited to specific cases of student/text matches or mismatches.

The literature describing the several adaptive teaching strategies reviewed in sections (a) through (f) above, while not conclusive, does provide some guidance as to their application in cases of student / text readability mismatches. At this time, however, we can only offer hypotheses regarding which adaptive teaching strategies are best suited to given situations of student / text mismatches.

While the jury is still out as to the validity and effectiveness of the various applications of the several adaptive teaching strategies, a considerable amount of work is underway to verify these applications. In the Levittown, New York Public Schools, for example, a team of about forty teachers have been piloting these strategies in various applications. The application of these strategies is summarized in Figure Five. There are three conditions of student / text readability correspondence as illustrated in Figure Five.

1. The first condition of student / text correspondence is a reasonable match between student readability level and the readability level of the text materials. Here, in effect, the student and the text are equal. Under such conditions, no special adaptive teaching strategy is necessary. Any of the teaching strategies reviewed in section (c) through (f) above would, of course, enhance instruction, but there is no prescriptive basis of the selection of one strategy over another.

FIGURE FIVE

INSTRUCTIONAL STRATEGIES

STUDENT (S) / TEXT (T) D.R.P. DISCREPANCIES		ADAPTIVE INSTRUCTIONAL STRATEGIES
S = T	•	No Prescribed Strategy; Vary Use Of All Strategies for General Readability Growth
S < T	•	Directed Reading Activity
	•	Cloze Technique
	•	Advance Organizers
	•	Directed Reading/Thinking Activity
S > T	•	Advance Organizers
	•	Levels of Comprehension
	•	Concept Development
	•	SQ3R

2. A second condition of student / text readability correspondence is where the student readability level is <u>below</u> that of the text materials. In such situations, the teacher is advised to begin with one or a combination of three adaptive instructional strategies: a) the Directed Reading Activity; b) Cloze procedures; and/or c) Advance Organizers. Here, advance organizers should be carefully selected since some advance organizers are not suited to situations where student readability is below that of the text. Advance organizers such as the following are recommended: preview of vocabulary, an outline preview of text either as supplied provided by the publisher in bold print headings or prepared on a ditto by the teacher, pre-reading of the material with an aide or

another student, a series of advance questions prepared by the teacher and designed to guide students' reading of the material, and/or a narrative preview of the material by the teacher. Although advance organizers could be considered as an independent strategy, they are herein considered as integral parts of various adaptive teaching strategies.

3. A third and final condition of student / text readability correspondence is where the student readability level is above that of the text materials. Under such conditions the teacher is advised to provide students with a greater challenge and demand more from the students and the text materials than is normally done. Adaptive instructional strategies such as the following are recommended: a) Advance Organizers; b) Levels of Comprehension; c) Concept Attainment; and d) SQ3R. Here again, care should be given to the selection of advance organizers. In situations where student readability is above text readability advanced organizers such as the following are recommended: pre-stated outcome objectives, a conceptual preview of material, a review of prerequisite concepts (as opposed to information), and game or simulation experiences related to the concepts in the new material.

Adaptive instructional strategies are prescriptive in nature: i.e., they should be implemented to compensate for specific conditions of student / text readability mismatches. The greater such discrepancy, the greater is the need for these strategies. A condition where the text readability level is only three or four D.R.P. units above the students' readability level may be com-

pensated by using only the directed reading activity. More severe cases of mismatches, however, require more intensive adaptive strategies. A condition where the text readability level is eight or nine units above that of the students, for example, may require the use of several advance organizers, a modification of the text materials using the Cloze technique and use of the directed reading activity.

IV. Implementation of the Readability Instructional Design

An instructional or curricular design can be effective only to the extent that it is implemented. The implementation of the Readability Instructional Design involves all levels of the school organization beginning with a textbook adoption policy at the district administration/board of education level. This component includes provisions for determining the readability levels of all text and other printed materials in use in the district. The implementation proceeds with the identification of the read-ability levels of all students utilizing the Degrees of Reading Power tests. The next component of implementation involves the development of an instructional model or set of procedures designed to a) assure matches between student read-ability levels and text readability levels, and/or b) provide for adaptive teaching strategies for mismatches. A fourth component of implementation involves a design for the training of staff in the instructional design and in the various adaptive teaching strategies. The final component includes provisions for supervising the implementation and progress of the instructional design.

A. Identification of the Readability Levels of Text Materials

Two things must occur in this component of implementation. The first is the adoption of a district policy or regulation regarding textbook adoptions. This policy should require that all text material to be considered for adoption in the district must be

accompanied by a D.R.P. readability analysis. The readability level of text materials is essential to the Readability Instructional Design. Most publishers are including such an analysis in recent and new editions of textbooks. The College Board provides D.R.P. rating for over 1500 texts and fiction titles with an annual update.

The second part of this component is the development of local, in-district capacity to conduct informal readability analyses of text and other printed materials. D.R.P. readability levels do not exist for all texts, especially older or less popular editions as well as much childrens' literature. The local school district must be able to ascertain with confidence the readability levels of all major print materials in use in the district.

Two informal methods exist for in-district determination of readability levels of text materials. The first involves the training of local personnel (usually a team of several teachers) in procedures of readability analysis similar to those used by Touchstone Associates in the "official" D.R.P. analyses for the College Board. The major advantage to this method is not the analysis itself but the development of a considerable amount of local expertise around the problems of readability on the part of the teachers trained to conduct the analyses. The major disadvantages to the local analysis team approach is the cost of initial training and the subsequent costs (either for substitutes or extra-curricular pay) associated with actual work on analyses.

The second method of in-district determination of text readability levels is via micro-computer analysis as described

earlier in this monograph. This process is analogous to the "official" D.R.P. methodology and incorporates the Bormuth formula and an accounting of the Dale long-list of words. Micro-computer readability analysis has the advantages of speed (approximately five times as fast as human analysis) and low repetitive costs (a student typist can enter the text for analysis). The major disadvantage of micro-computer readability analysis is the initial cost of the computer hardware (between two and three thousand dollars).

B. Identification of the Read-Ability Levels of Students

This component is straightforward. It involves the testing of all students using the Degrees of reading Power tests. The frequency of the administration of this test may vary. Once annually for all students seems appropriate for the implementation of the Readability Instructional Design. If the D.R.P. tests are to be part of a pre/post evaluation design or a formative evaluation design more frequent administration may be necessary.

C. Instructional Design

The manner in which a) text materials are to be matched to students, b) alternative teaching strategies are to be implemented in cases of mismatches and c) other uses of readability data (grouping, setting standards, etc.) must be clearly described in an instructional design such as that reviewed in this monograph. All appropriate personnel including building and district

administrators should be thoroughly familiar with this instructional design. Building supervisors should be prepared to assist teachers, particularly content area teachers, in the implementation of readability teaching strategies.

D. Staff Training

The training of staff for the implementation of the Readability Instructional Design has two aspects. The first is the development of the cadre concept among the trainees. In the Levittown, New York schools, a team of two teachers from each building came together to form the district's D.R.P. "cadre". Historically, a cadre is an intimate group with a definite mission, coming together for an indefinite period of time, and disbanding when the mission is accomplished. The cadre provides its members with information and support at regularly appointed meetings between which members of the cadre "go out" pressing converts to the mission.

The acquisition of technical skills is a second and important aspect of staff training. In the Readability Instructional Design, technical skills consist of a knowledge of text and student readability levels and a set of teaching strategies and models for dealing with readability mismatches. In the Levittown model, Bruce Joyce's (1980) training paradigm for the acquisition of new teaching strategies is followed. This involves three stages, the first of which deals with a review of the theory behind the teaching technique or model. The second stage involves

demonstration of the technique, and the third stage includes practice and coaching. Coaching, the mutual observation/feedback and recycling of the new skill between cadre members, is of paramount importance in Joyce's paradigm of complex skill acquisition. It is for this reason that at least two teachers from each school building should serve on the district team; for it is in their classrooms that practice and coaching occurs.

E. Supervising the Implementation of the Readability Instructional Design

The members of the district-wide D.R.P. cadre, in addition to developing their own proficiencies with D.R.P. instructional strategies, assume the responsibility for leading the implementation of the Readability Instructional Design back in their home schools. To this end, these members and their respective principals form a training and implementation alliance wherein the concepts, strategies, and other workshop experiences from the district-wide training are duplicated with staff at the building level.

The building principal supervises the ongoing implementation and improvement of the Readability Instructional Design in a number of specific ways. First, the principal requests of teachers on a regular basis information regarding the D.R.P. read-ability levels of students in relation to the instructional grouping established in and among classrooms. Second, the principal request of teachers on a regular basis information regarding the readability level of

texts and other printed materials used in instruction. Here, the principal questions the relationship and appropriateness thereof of these materials to student D.R.P. levels, particularly as they are assigned at the independent and instructional levels. And third, where discrepancies are noted between student read-ability and text readability levels, the principal asks what compensatory teaching strategies are being implemented and seeks to determine the effectiveness of these strategies, recommending improvements in the implementation of these strategies and/or alternative strategies where necessary.

The district supervision of the implementation of the Readability Instructional Design centers around the development, with each building principal, of a readability implementation plan for each building. Where the school district utilizes performance objectives or management-by-objectives administration design, these implementation plans would be assumed within such procedures. The readability implementation plan should itemize what is to be done by whom and when, and what resources, material, human and training, are necessary to carry out the plan. Finally, the implementation plan should describe the expected outcomes for students in terms of achievement and effect.

V. Evaluating Student Progress in the Conceptual Understanding of Connected Prose

The Readability Instructional Design promises to improve and maintain the standards of student conceptual understanding, not only of reading textbooks, but all printed material. Student readability assessment, therefore, should not be isolated to a single test or subject area such as reading/language arts. Conceptual understanding should be assessed in all areas where extended print materials are used for instruction.

A. Assessment in the Area of Reading Instruction

In Reading, Language Arts and English classes, a close record of student readability gain should be maintained. One of the most beneficial aspects of the Degrees of Reading Power index scores is that they represent equal intervals. Therefore, gains and deficiencies of equal D.R.P. units at any point on the scale are of equal value in terms of time and effort necessary on the part of the student to make a unit of gain. D.R.P. growth should reveal a uniformity of rate over time for any individual student. Further, the rate of growth for all students should meet specific standards as set by the district.

The Readability Instructional Design recommends the following D.R.P./ grade-level minimum standards:

Grade	Minimum D.R.P. Level
3	40
4	43
5	47
6	50
7	53
8	56
9	59
10	61
11	64
12	67

In the above table of minimum standards, a year's minimum expected growth is equivalent to approximately three D.R.P. units. In traditional terms, this represents the long-honored standard of one-year-of-school/one-year's growth.

Additionally, evaluation of student readability gains from year-to-year should be made for average and above average expectancies as previously discussed and illustrated in Figure Four. While the minimum annual readability gain may be approximately three units, the typical or average student should gain about four units in readability each year while the advanced student should be evaluated against an annual standard of five readability units.

Evaluation in Reading, Language Arts and English classes should also include such techniques as reading conferences wherein the teacher can assess through structured interaction with the student his or her conceptual understanding of the book under discussion. A final evaluative technique that should be utilized in this area is an ethnographic reading record. Such a record should indicate a steady growth in the amount and conceptual difficulty of a student's independent reading choices.

B. Assessment in the Content Areas

The Readability Instructional Design is concerned with students' conceptual understanding of text materials. Testing in the content areas, therefore, should focus on the higher level thinking skills of analysis, synthesis and evaluation. It is neither the promise of the Readability Instructional Design nor the probability resulting therefrom that students will display greater recollection of detail, facts, or improvements in such lower level thinking skills. It is, however, a likely outcome of the implementation of the Readability Instructional Design that students, who are either equally matched to their textbooks in terms of readability levels or are provided with adaptive instructional strategies in cases of student / text mismatches, will gain in their understanding of concepts in their content area courses.

C. Standardized Testing

With all their shortcomings, standardized tests do represent an important frame of reference for student and program assessment. If a district's reading instruction is significantly better than those of the school districts comprising a test's norming sample, it is reasonable to expect that students in such a district will perform better on the standardized test than will students of comparable abilities in the norming sample. Comparison should be made, therefore, using the national percentile metric of whatever

standardized test a district uses. Caution should be exercised, however, in interpreting any standardized test results as they may relate to the effect of a readability instructional design. This is so because such tests tend to measure discreet, isolated reading skills rather than conceptual understanding of connected prose. Reference to the item analyses for standardized test items dealing with comprehension and concepts is advised.

The Readability Instructional Design promises to improve and maintain students' conceptual understanding of connected prose both in formal reading instruction and in the content area. This is a bold promise, but one which appears to be within the reach of all teachers, in all subject areas and at all grade levels. The means for securing baseline and criterion-referenced data on student read-ability is now available via the Degrees of Reading Power tests. The means for securing text readability data that is correlated to student read-ability data is also available through several methods. Matching students to appropriate text materials can now be a reality. Finally, adaptive teaching strategies are available for use in situations of student/text mismatches and for the development of conceptual understanding of connected prose in children.

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